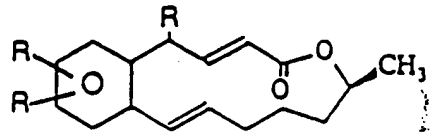
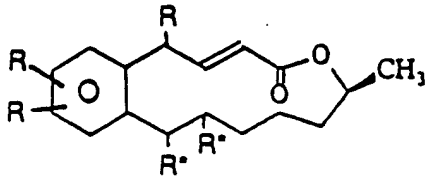
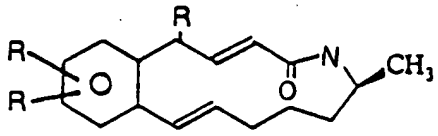
CLAIMS

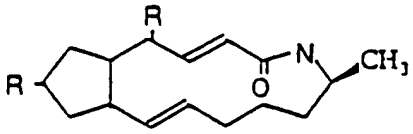
1. A compound that induces long term potentiation when administered peripherally to a mammal.

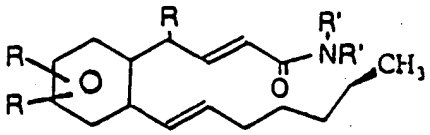
2. A compound of claim 1, wherein the compound has a formula selected from the group consisting of:

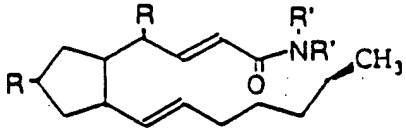


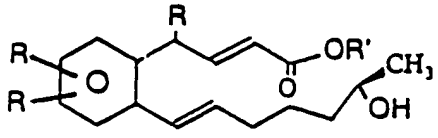


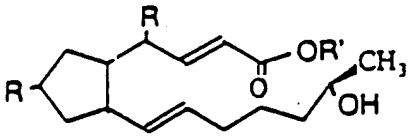












wherein each R is independently selected from -OH, -OR^1, -SH, -SR^1, -NR^2R^2, and a carbonyl oxygen; each R' is independently a C_1 to C_4 alkyl; each R" is independently selected from hydrogen, -OH, -OR^1, and -NR^2R^2; wherein R"' is independently selected from -CHO,

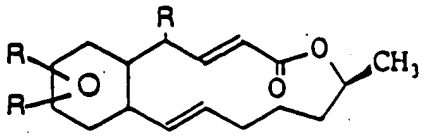
-COOH, -CR^1, -CR^1, and -$CONR^2R^2$; and R* is hydrogen or -OH; and wherein R^1 is a C_1 to C_4 alkyl; and R^2 is hydrogen or a C_1 to C_4 alkyl.

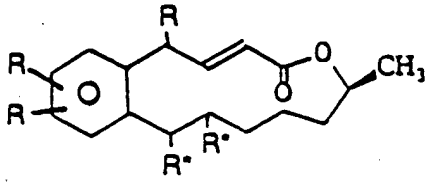
3. A compound of claim 1 or 2 wherein the compound produces at least 50% of the population spike or field excitatory postsynaptic potential in slices of hippocampal tissue as is generated by administration of Brefeldin A.

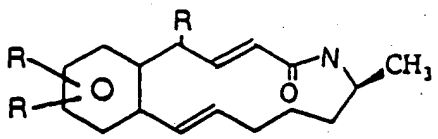
4. A method for enhancing learning in a mammal by administration of a therapeutic amount a compound that induces long term potentiation when administered peripherally to a mammal.

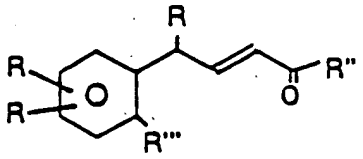
5. A method of claim 4, wherein the compound is Brefeldin A.

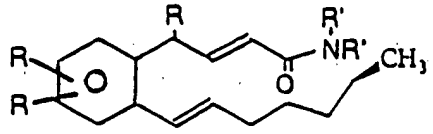
6. A method of claim 4 wherein the compound has a formula selected from the group consisting of:

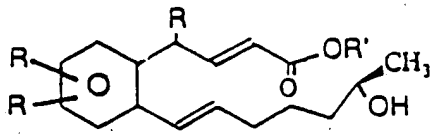




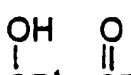






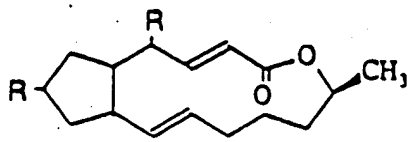
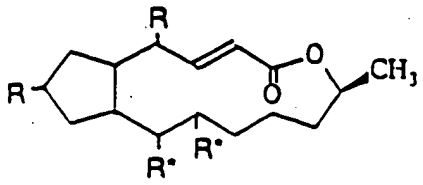
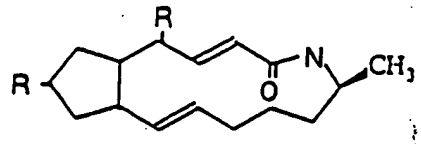
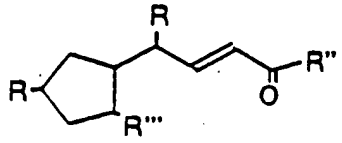
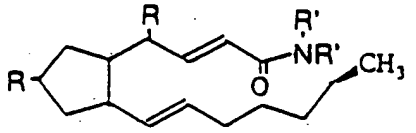
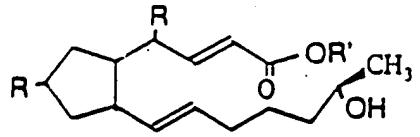


wherein each R is independently selected from -OH, -OR^1, -SH, -SR^1, -NR^{2}R^2, and a carbonyl oxygen; each R' is independently a C_1 to C_4 alkyl; each R" is independently selected from hydrogen, -OH, -OR^1, and -NR^{2}R^2; wherein R"' is independently selected from -CHO,



-COOH, -CR^1, -CR^1, and -CONR^{2}R^2 ; and R* is hydrogen or -OH; and wherein R^1 is a C_1 to C_4 alkyl; and R^2 is hydrogen or a C_1 to C_4 alkyl.

7. The method of claim 4, wherein the compound has a formula selected from the group consisting of

wherein each R is independently selected from -OH, -OR^1, -SH, -SR^1, -NR^{2}R^2, and a carbonyl oxygen; each R' is independently a C_1 to C_4 alkyl; each R" is independently selected from hydrogen, -OH, -OR^1, and -NR^{2}R^2; wherein R"" is independently selected from -CHO,

-COOH, -CR^1, -CR^1, and -CONR^{2}R^2 ; and R* is hydrogen or -OH; and wherein R^1 is a C_1 to C_4 alkyl; and R^2 is hydrogen or a C_1 to C_4 alkyl.

8. The method of claim 4, wherein the amount of the compound is from about 1.0 to 15.0 mg/kg of body weight.

9. The method of claim 8, wherein the amount of the compound is from about 3.0 to 10.0 mg/kg of body weight.

10. The method of claim 4, wherein the compound is administered intraperitoneally.

11. The method of claim 4, wherein the subject has a healthy brain.

12. The method of claim 5, wherein the compound is administered intraperitoneally.

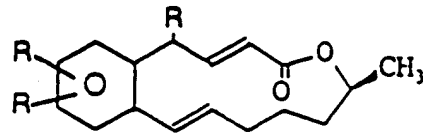
13. The method of claim 6 or 7, wherein the compound is administered up to seven days before the learning.

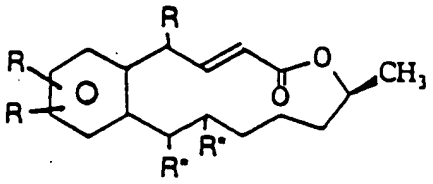
14. The method of claim 6 or 7, wherein the compound is administered up to two hours after the learning.

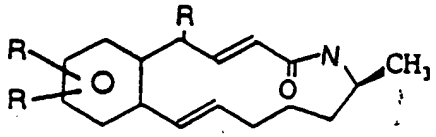
15. The method for treating memory dysfunction in a mammal by administration of a therapeutic amount of a compound that induces long term potentiation when administered peripherally.

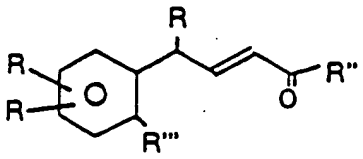
16. The method of claim 15, wherein the compound is Brefeldin A.

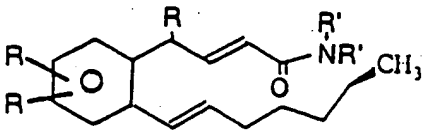
17. The method of claim 15 wherein the compound has a formula selected from the group consisting of:

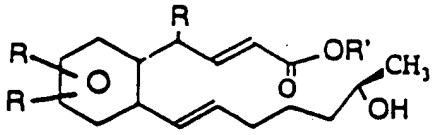




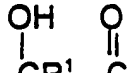






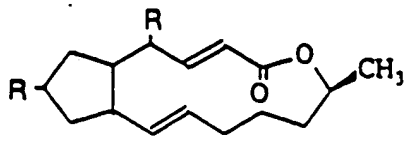
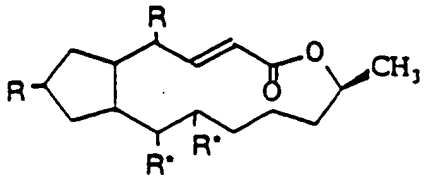
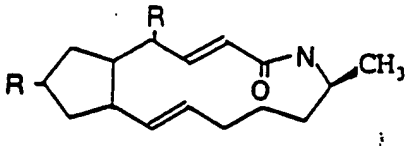
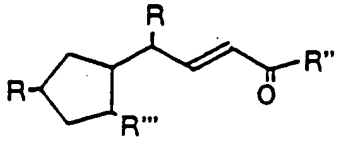
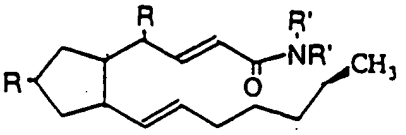
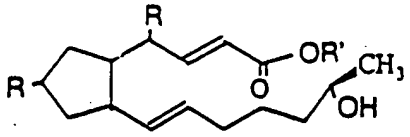


wherein each R is independently selected from -OH, -OR^1, -SH, -SR^1, -NR^{2}R^2, and a carbonyl oxygen; each R' is independently a C_1 to C_4 alkyl; each R" is independently selected from hydrogen, -OH, -OR^1, and -NR^{2}R^2; wherein R"" is independently selected from -CHO,



-COOH, -CR^1, -CR^1, and -CONR^{2}R^2 ; and R* is hydrogen or -OH; and wherein R^1 is a C_1 to C_4 alkyl; and R^2 is hydrogen or a C_1 to C_4 alkyl.

18. The method of claim 15, wherein the compound has a formula selected from the group consisting of:

wherein each R is independently selected from -OH, -OR^1, -SH, -SR^1, -NR^{2}R^2, and a carbonyl oxygen; each R' is independently a C_1 to C_4 alkyl; each R" is independently selected from hydrogen, -OH, -OR^1, and -NR^{2}R^2; wherein R"" is independently selected from -CHO,

-COOH, -CR^1, -CR^1, and -CONR^{2}R^2 ; and R* is hydrogen or -OH; and wherein R^1 is a C_1 to C_4 alkyl; and R^2 is hydrogen or a C_1 to C_4 alkyl.

19. The method of claim 15, wherein the memory dysfunction is associated with a decrease in the efficiency of synaptic transmission or loss of functioning synapses in the hippocampus.

20. The method of claim 15, wherein the amount of the compound is from about 1.0 to 15.0 mg/kg of body weight.

21. The method of claim 15, wherein the amount of the compound is from about 3.0 to 10.0 mg/kg of body weight.

22. The method of claim 15, wherein the compound is administered intraperitoneally.